

IN THE CLAIMS:

Please cancel claims 1-32 without prejudice or disclaimer, and substitute new claims 33-64 therefor as follows:

Claims 1-32 (Cancelled).

33. (New) A method for configuring the radiation characteristics of an antenna, comprising the steps of:

including in said antenna a plurality of radiating elements;

associating to each of said radiating elements at least a respective signal processing chain, including in said respective chain:

at least one module for weighting digital signals capable of applying to a digital signal at least a respective weighting coefficient, and

at least one antenna conversion set interposed between said module for weighting digital signals and one of the radiating elements of the antenna, said antenna conversion set being configured to operate on digital signals on the side of said respective weighting module and on analogue signals on the side of the antenna element; and

causing the propagation of a signal distributed on the processing chains associated to said plurality of radiating elements of the antenna by applying respective weighting coefficients to said digital signal weighting modules, said weighting coefficients determining the radiation diagram of the antenna.

34. (New) The method as claimed in claim 33, comprising the step of including in said signal processing chains first and second modules for weighting digital signals as well as first and second antenna conversion sets, said first weighting modules and antenna conversion sets operating on the signal propagated toward said radiating elements of the antenna, said second weighting modules and antenna conversion sets operating on the signal propagated starting from said radiating elements of said antenna.

35. (New) The method as claimed in claim 34, comprising the step of applying to said first weighting modules and to said second weighting modules weighting coefficients wherein said radiation diagram applied by said antenna to said signal is equal both for the signal propagated toward said antenna and for the signal propagated starting from said antenna.

36. (New) The method as claimed in claim 34, comprising the step of applying to said first weighting modules and to said second weighting modules weighting coefficients wherein said radiation diagram applied by said antenna to said signal is different for the signal propagated toward said antenna and for the signal propagated starting from said antenna.

37. (New) The method as claimed in claim 33, comprising the step of including in said antenna conversion set at least a conversion function operating between the radio frequency and the base band.

38. (New) The method as claimed in claim 33, comprising the step of including in said antenna conversion set at least a conversion function operating between the radio frequency and the intermediate frequency.

39. (New) The method as claimed in claim 34, comprising the step of associating to said first and second antenna conversion sets signal distribution elements capable of operating both on a signal propagated toward said antenna and on a signal propagated starting from said antenna.

40. (New) The method as claimed in claim 39, comprising the step of choosing said signal distribution elements from the group of radio frequency duplexers and switches.

41. (New) The method as claimed in claim 33, comprising the steps of:
generating a plurality of replications of a signal to be fed toward said antenna;
and

sending said replications of the signal on respective processing chains associated to said radiating elements of the antenna.

42. (New) The method as claimed in claim 33, comprising the step of collecting the components of a signal received starting from said antenna and distributed on said respective processing chains by forming a single signal from said components.

43. (New) The method as claimed in claim 33, comprising the steps of:
incorporating in said distributed signal the information pertaining to said
weighting coefficients; and

extracting said weighting coefficients starting from said signal in view of their
application to said weighting modules.

44. (New) The method as claimed in claim 33, comprising the step of
associating to the antenna a module for converting the signal, which propagates on said
processing chains associated to said radiating elements of the antenna, between an
optical format and an electrical format, so that said signal is capable of being
transmitted with respect to said antenna in optical format.

45. (New) The method as claimed in claim 44, comprising the step of
including in the signal propagated in optical format the information about said weighting
coefficients applied to said digital signal weighting modules.

46. (New) The method as claimed in claim 33, comprising the step of placing
said processing chains associated to said radiating elements of the antenna in close
proximity to the antenna itself.

47. (New) An antenna with configurable radiation characteristics, comprising:
a plurality of antenna radiating elements; and
associated to each of said radiating elements, at least a respective signal
processing chain, the processing chain in turn comprising:

at least one digital signal weighting module capable of applying to a digital
signal at least a respective weighting coefficient, and

at least one antenna conversion set interposed between said module for
weighting digital signals and one of the radiating elements of the antenna, said antenna
conversion set being configured to operate on digital signals on the side of said
respective weighting module and on analogue signals on the side of the antenna
element, the arrangement being such that the weighting coefficients applied to said
digital signal weighting modules determine the radiation diagram of the antenna.

48. (New) The antenna as claimed in claim 47, wherein said signal
processing chains comprise first and second digital signal weighting modules as well as
first and second antenna conversion sets, said first weighting modules and antenna
conversion sets operating on a signal propagated toward said radiating elements of the
antenna, said second weighting modules and antenna conversion sets operating on a
signal propagated starting from said radiating elements of said antenna.

49. (New) The antenna as claimed in claim 48, comprising at least one weighting control block configured to apply to said first weighting modules and said second weighting modules weighting coefficients wherein said radiation diagram applied by said antenna to said signal is equal both for the signal propagated toward said antenna and for the signal propagated starting from said antenna.

50. (New) The antenna as claimed in claim 48, comprising at least one weighting control block configured to apply to said first weighting modules and said second weighting modules weighting coefficients wherein said radiation diagram applied by said antenna to said signal is different for the signal propagated toward said antenna and for the signal propagated starting from said antenna.

51. (New) The antenna as claimed in claim 47, wherein said antenna conversion set comprises at least one frequency converter operating between the radio frequency and the base band.

52. (New) The antenna as claimed in claim 47, wherein said antenna conversion set comprises at least one frequency converter operating between the radio frequency and the intermediate frequency.

53. (New) The antenna as claimed in claim 48, wherein said first and second antenna conversion sets are associated signal distribution elements capable of operating both on a signal propagated toward said antenna and on a signal propagated starting from said antenna.

54. (New) The antenna as claimed in claim 53, wherein said signal distribution elements are selected from the group of radio frequency duplexers and switches.

55. (New) The antenna as claimed in claim 47, comprising a distributing element configured to:

generate a plurality of replications of a signal to be fed toward said antenna; and
sending said replications of the signal on respective processing chains associated to said radiating elements of the antenna.

56. (New) The antenna as claimed in claim 47, comprising a collecting element configured to collect the component of a signal received starting from said antenna and distributed on said processing chains associated to said radiating elements of the antenna.

57. (New) The antenna as claimed in claim 47, comprising an extraction module configured to extract said weighting coefficients in view of the application to said weighting modules starting from said signal.

58. (New) The antenna as claimed in claim 47, wherein said processing chains associated to said radiating elements of the antenna are located in close proximity to the antenna itself.

59. (New) An apparatus comprising an antenna as claimed in claim 47, wherein the antenna is associated to:

an electro-optical converter module configured to convert the signal, that propagates on said processing chains associated to said radiating elements of the antenna, between an optical format and an electrical format.

60. (New) The apparatus as claimed in claim 59, wherein said electro-optical converter module has associated therewith an extraction module configured to extract said weighting coefficients in view of the application to said weighting modules starting from said optical signal.

61. (New) A radio base station comprising an apparatus as claimed in claim 59, comprising a control unit and an optical link for the transmission of an optical signal between said control unit and said electro-optical converter module associated to said antenna.

62. (New) The radio base station as claimed in claim 61, wherein said control unit comprises a function block that is able to generate an information signal and a signal for controlling the radiation diagram of the antenna.

63. (New) A telecommunications network comprising at least an antenna as claimed in claim 47.

64. (New) A data processing product capable of being loaded into the memory of at least an electronic device and comprising portions of software codes capable of implementing the method as claimed in claim 33.